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ABSTRACT

These national apprenticeship and training standards for the Communications Workers of America (CWA) begin with the policy of the CWA and definitions. A discussion of program supervision defines the responsibilities of the National Advisory Committee and local program sponsors. National Apprenticeship Standards are listed that relate to qualifications for application; selection of apprentices; affirmative action plan; equal opportunity pledge; credit for demonstrated competence; probationary period; records; term of apprenticeship; hours of work; apprentice wages; ratio of journeyworkers to apprentices; work processes; related instruction; safety and health training; certification of completion of apprenticeship; registration, modification, and deregistration; apprenticeship agreement; local standards registration; complaints; transfer of training obligation; work experience; and examinations. Appendixes include work processes and a curriculum for a training program in communications. (YLB)

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National Apprenticeship and Training Standards for the CWA

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U.S. Department of Labor
Employment and Training Administration

CE 037 332

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National Apprenticeship and Training Standards for the CWA

U.S. Department of Labor
Raymond J. Donovan, Secretary

Employment and Training Administration
Albert Angrisani
Assistant Secretary for Employment and Training

Bureau of Apprenticeship and Training
Revised 1982

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1. Policy

It is a basic policy of the Communications Workers of America (CWA) to provide for training and opportunity for growth for all its members. This, in turn, promotes continuity and growth for all CWA members.

The important objective is to meet the needs of the industry for skilled and competent journeyworkers. Actual experience and related instruction constitute the hardcore of training conducive to career success in the industry.

It is recognized that the time needed to acquire these basic fundamentals will vary with the ability and application of the individuals, the area of specializations for which they are training, and the facilities available.

2. Definitions

a. Apprentice: An individual who has signed an apprenticeship agreement for training in an occupation as outlined in these standards, and who is registered with the appropriate Registration Agency.

b. Apprenticeship Agreement: A written agreement between a sponsor and the apprentice. The agreement shall be approved and signed by the authorized person and then registered with the Registration Agency.

c. Employer: Any organization whose employees are members of the Communications Workers of America who has the facilities and equipment to train apprentices in accordance with the terms and conditions of these national standards.

d. Coordinator: The individual selected to organize and administer the local apprenticeship program in accordance with the local standards.

e. Registration Agency: A State apprenticeship agency recognized by the Bureau of Apprenticeship and Training, U.S. Department of Labor, or in States where there is no recognized agency, it shall mean the Bureau of Apprenticeship and Training, U.S. Department of Labor.

f. National Standards[1]: This entire document which will serve as a guide and minimum standards for development of local standards of apprenticeship.
g. Local Standards: The document that is developed for operating a program of apprenticeship and registered with the appropriate registration agency.
h. Completion Certificate: The certificate awarded to graduates of this apprentice training program certifying that the individual has successfully completed the required training to be classified as a journeyworker.
i. Journeyworker: A person who has completed an apprentice training program in accordance with these standards.
j. National Advisory Committee: A committee consisting of persons from CWA, participating employers and others whose expertise will contribute to development of apprenticeship. These people will be selected under procedures established by the Trust Agreement of the Communications Workers of America National Training Fund for the Communications Industry.
k. Related Instruction: Classroom and other forms of instruction to reinforce the on-the-job training.
l. CWA: Communications Workers of America
m. Sponsor: Employer, or Joint Training Committee where such exists.
n. Work Processes: Tasks learned on the job in which the apprentice must be proficient before a completion certificate is granted.

3. Program Supervision

The Communications Workers of America National Training Fund for the Communications Industry will oversee these national standards and their use to obtain the maximum effectiveness of local apprenticeship programs and to insure the availability of competently trained personnel.

It is recommended that each sponsor appoint an apprenticeship coordinator whose duty it is to ensure that each appren-

1 Local application of these national standards in States having recognized apprenticeship councils may require adaptation to meet the standards of apprenticeship in such states. The staffs of the Bureau of Apprenticeship and Training and the State apprenticeship agencies are available to advise on such standards.

tice is given the variety of work experience and related instruction required by the local standards. Local standards shall not conflict with any existing agreement or with local, State, or Federal regulations.

a. **National Advisory Committee:** This committee will be an administrative body whose members shall be selected under the terms of the trust agreement of the Communications Workers of America National Training Fund for the Communications Industry. It will be directly responsible for apprenticeship and training under the purview of this agreement. The committee shall make every effort to maintain the application of these national standards. Any adjustment of these standards to the needs of the industry rests with this committee. The Advisory Committee will maintain a constant surveillance of apprentices, apprentice problems and new requirements. It will develop new training criteria, guidelines, and measures of attainment in the apprenticeship and other training programs as new conditions dictate. Further, the Advisory Committee will provide six additional services.
    1. Promote the development of local apprenticeship programs as appropriate.
    2. Promote and oversee the training of trainers for apprentices.
    3. Identify skills that are commonly shared by job titles as they are attached to these standards and assure consistency in their training.
    4. Maintain centralized records of apprentices and their competencies.
    5. Develop accreditation standards and accredit telecommunications training programs.
    6. Develop curriculum and supporting material.

A representative from the Bureau of Apprenticeship and Training, U.S. Department of Labor, is available upon request to attend meetings as advisor and consultant on labor standards applicable to apprentices, on the development of problems relating to apprentices and apprenticeship.

Any of the administrative responsibilities of the National Advisory Committee described anywhere in these National Standards

may be delegated to the appropriate individual(s) designated by the President of CWA.

b. **Local Program Sponsors:** The use of local joint training committees, equally representative of management and labor, is recommended in the operation of local programs. The local standards should conform as nearly as possible to these national standards. Local joint training committees will perform their duties under the guidance of the National Advisory Committee.
It shall be the responsibility of the local program sponsor to:
   1. Determine the need for apprentices;
   2. Approve apprenticeship selections;
   3. Submit indenture agreements to the National Advisory Committee for approval;
   4. Assure that necessary on-the-job experience and related instruction are provided under guidelines established by the National Advisory Committee;
   5. Conduct standardized periodic examination of apprentices;
   6. Notify the appropriate registration agency and the Advisory Committee of any cancellation or termination of apprenticeship agreements;
   7. Prepare and submit all necessary reports concerning its program to the local, State or Federal agencies; and
   8. Supervise the enforcement of the provisions of the local apprenticeship and training standards.

So as to avoid misunderstandings, it is to be understood and agreed upon that these National Apprenticeship Standards shall not be in conflict with any existing labor agreement nor any local, State or Federal regulation.

4. Qualifications for Application

To be eligible for registration into the apprenticeship program, all applicants will be required to meet the following qualifications, as a minimum:

a. At least 16 years of age unless State law requires a higher minimum age. (Proof of age required.);

b. Must have successfully completed four years of high school, or furnish evidence of general education development equivalency; and
c. Must be physically fit to perform the work of the trade.

5. Selection of Apprentices

Selection Procedures

Local apprenticeship program sponsors shall develop appropriate apprentice selection standards, procedures, and rating systems consistent with requirements of Title 29, CFR Part 30, Equal Employment Opportunity in Apprenticeship and Training as amended.

This requirement means that the selection of apprentices under this program shall be made from qualified applicants on the basis of qualifications alone, without regard to race, religion, color, sex, national origin, or physical handicap, under objective standards which permit review, after full and fair opportunity for application. This program shall be operated on a completely nondiscriminatory basis. Local Bureau of Apprenticeship and Training representatives are available to assist local Program Sponsors with preparing these selection procedures.

6. Affirmative Action Plan

In addition to establishing minimum qualifications for apprenticeship, each local program sponsor with five or more apprentices will be required to develop and adopt an affirmative action plan which, if appropriate under Title 29, CFR, Part 30, 30.4(d), shall include goals and timetables for the selection of minority and female (minority and nonminority) applicants and its local labor market analysis upon which such goals and timetables, or lack thereof, are based, and shall adopt a selection method consistent with the requirements of Title 29 of the Code of Federal Regulations, Part 30, as amended.

7. Equal Opportunity Pledge

All programs of apprenticeship registered with the Bureau of Apprenticeship and Training, U.S. Department of Labor, or a recognized State Apprenticeship Agency, must include in their standards the following equal opportunity pledge: "The recruitment, selection, employment and training of apprentices during

their apprenticeship shall be without discrimination because of race, color, religion, national origin, or sex. The sponsor will take affirmative action to provide equal opportunity in apprenticeship and will operate its apprenticeship program as required under Title 29 of the Code of Federal Regulations, Part 30."

8. Credit for Demonstrated Competence

Upon finding that applicants have demonstrated competence through either practical or educational experience, to qualify for advanced standing in the apprentice training program, applicants may be granted credit toward the term of apprenticeship, subject to review by the local sponsor and using procedures approved by the National Advisory Committee. Where such credit is granted, trainees will be paid at the rate for the period to which they have advanced.

9. Probationary Period

Apprentices employed under local programs shall be subject to a probationary period, not to exceed three months or 500 hours of reasonably continuous employment. Upon satisfactory completion of the probationary period, apprentices will be given credit toward their apprenticeship for training and time spent in probationary status.

During this probationary period, either party may terminate the agreement of apprenticeship without stated cause by notifying the other party. If the apprentices fail to apply themselves, seem unable or unwilling to adapt to the trade conditions, or is otherwise found to be unsuited to the trade, they shall be dropped from the program before the expiration of the probationary period.

After completion of the probationary period, the agreement may be cancelled at the request of the apprentice, or may be suspended, cancelled or terminated by the sponsor, for reasonable cause, with due notice to the apprentice and a reasonable opportunity for corrective action. The registration agency shall be advised in writing of all cancellations and the reasons for such action.

During the probationary period, it is anticipated that apprentices will have an opportunity to observe various aspects of work in this industry. After this initial exposure, apprentices should be able to decide if the work is to their liking and whether they have the ability to absorb further training.

10. Records

Provision shall be made for recording, maintaining, and monitoring all records concerning apprenticeship as may be required by the Bureau of Apprenticeship and Training or recognized State Apprenticeship Agency and other applicable law.

All records of apprenticeship, including applications and the selection process, must be retained for five years and made available to the Registration Agency upon request.

11. Term of Apprenticeship

The term of apprenticeship will be established by these apprenticeship standards in accordance with the work proceses on the attached Task Outlines. The processes may be revised as changes in plant systems require or to improve the training program.

The performance based training is individually paced and is performance, rather than time, oriented. The performance based training is designed so that in both related instruction and on-the-job training.

a. Apprentice movement through the program is based on demonstrated task performance rather than number of hours of training;
b. Performance is measured using established and systematically applied achievement and tests; and
c. The effectiveness of the training program in developing competent on-the-job performance is continuously monitored for both performance results and cost effectiveness.

12. Hours of Work

The workday and workweek for apprentices and conditions associated therewith shall be the same as those of other classifications of employees doing comparable work and consistent with the applicable labor agreement. Each hour worked by the apprentice will be credited to the term of apprenticeship.

13. Apprentice Wages

Apprentices shall be paid for each hour worked and in related instruction during normal working hours at a progressively increas-

ing schedule of wages to be established on a percentage of the prevailing local journeyworker's wage rate.

Payments for tuition fees, books, and supplies required for approved courses, and gratuities upon the successful completion of the apprenticeship, may be granted in accordance with local custom.

Schedules for varying terms of apprenticeship are as follows:

Communications Technician I

Initial—50% of Communications Technician I rate

50% of instruction complete—75% of Communications Technician I rate

100% of instruction complete—100% of Communications Technician I rate

Communications Technician II

Initial—100% of Communications Technician I rate

50% of instruction complete—Communications Technician I rate plus 50% of the difference between Communications Technician I and Communications Technician II rate

100% of instruction complete—100% of Communications Technician II rate

Communications Technician III

Initial—100% of Communications Technician II rate

50% of instruction complete—Communications Technician II rate plus 50% of the difference between Communications Technician II rate and Communications Technician III rate

100% of instruction complete—100% of Communications Technician III rate

However, the starting wage for apprentices must not be below the Federal minimum wage. Whether or not time spent in related instruction is to be paid shall be stated in the apprenticeship agreement.

14. Ratio of Journeyworkers to Apprentices

The provision in local standards covering the ratio of apprentices to journeyworkers shall be negotiated in accordance with local practices, or as stated in local collective bargaining agreements.

No more apprentices shall be employed than can be given proper supervision on the job and afforded employment opportunity on completion of apprenticeship. The suggested ratio of journeyworkers to apprentices shall be 3 to 1.

15. Work Processes

Each apprentice shall be given work experience in the major basic trade elements as per the schedule which is attached to these standards of apprenticeship and made part hereof (Appendix A). Wherever appropriate, every attempt will be made to develop competency-based programs for apprentices.

16. Related Instruction

In addition to the training received on the job, each apprentice shall be required to complete the equivalent of a minimum of 144 hours per year of related and supplemental training. This training program is set forth in Appendix B. Correspondence courses and other forms of self-study may be substituted for selected instruction.

17. Safety and Health Training

The employer shall instruct the apprentice in safe and healthful work practices and shall insure that the apprentice is trained in facilities and other environment that are in compliance with either the occupational safety and health standards promulgated by the Secretary of Labor under Public Law 91-596, dated December 29, 1970, or State standards that have been found to be at least as effective as the Federal Standards.

18. Certificate of Completion of Apprenticeship

Upon satisfactory completion of the apprenticeship by the apprentice, the program sponsor will recommend to the Registration Agency that a Certificate of Completion of Apprenticeship be awarded to the apprentice.

19. Registration, Modification and Deregistration

The registration of these standards by the Bureau of Apprenticeship and Training (BAT) certifies that the standards conform to the labor standards which the U.S. Department of Labor

believes are necessary to safeguard the welfare of apprentices in our industry. The Labor Department's general labor standards for apprenticeship programs are set forth in Title 29 of the Code of Federal Regulations, Part 29.

These National Standards of Apprenticeship may be modified at any time by the National Advisory Committee. However, before becoming effective, such modification shall be submitted to the Bureau of Apprenticeship and Training for approval. Local apprenticeship programs may be amended subject to approval of the National Advisory Committee and the appropriate Registration Agency. Modifications shall not alter apprenticeship agreements in effect without the expressed consent of all parties to the agreement.

This program may be deregistered upon the voluntary action of the National Advisory Committee, by request for cancellation of the registration. The program may also be deregistered, for reasonable cause, by the Bureau of Apprenticeship and Training formal deregistration proceedings in accordance with the provisions of Part 29 of Title 29 of the Code of Federal Regulations.

Upon deregistration or voluntary cancellation of the program, the sponsor will inform each apprentice, within 15 days, of the deregistration or cancellation, and the effect of such action. This notification will conform to the requirements of CFR 29.7.

20. Apprenticeship Agreement

The apprentice shall be covered by a written apprenticeship agreement, signed by the apprentice and the sponsor and registered with the appropriate Registration Agency. Such agreement shall contain a statement making the terms and conditions of the local standards a part of the agreement, together with a schedule of work processes and wage rates.

Some State apprenticeship agencies require the use of their own apprenticeship agreement forms. In such instances, the agreement forms may be obtained from the staffs of either the State apprenticeship agencies or the Bureau of Apprenticeship and Training, U.S. Department of Labor.

Each applicant selected shall be given an opportunity to study the standards, related local policies, and the apprenticeship agreement before signing the agreement.

At least five copies of the agreement shall be made—one for the apprentice (parent, guardian, or legal representative if ap-

plicable); one for the local sponsor; one for the Registration Agency; one for the National Advisory Committee; and, when applicable, one for the Veterans' Administration.

Where required by law and/or the local custom, the apprenticeship agreement will also be signed by the apprentice's parent, guardian, or legal representative.

21. Local Standards Registration

Local apprenticeship standards, and any amendments thereto, shall be submitted to the Registration Agency for registration following approval by the National Advisory Committee.

22. Complaints

The National Advisory Committee will be the appropriate authority under the program to receive, process, and make disposition of complaints.

In the event of disagreement between the sponsor and the apprentice of disputes arising concerning provisions of the local apprenticeship standards, either party may consult the Registration Agency for an interpretation of opinion. Both parties may also avail themselves of the grievance procedures of any existing collective bargaining agreement.

No provisions of the local apprenticeship program shall be in conflict with terms and conditions established by collective bargaining. In the event of conflict, collective bargaining agreements shall prevail.

23. Transfer of Training Obligation

When the local sponsor is unable to fulfill its training obligation under the apprenticeship agreement, the training obligation may be transferred under the same program with consent of the apprentice and program sponsor. The apprentice must receive from the new employer credit for the training already satisfactorily completed.

24. Work Experience

Apprentices will work with journeyworkers and will receive work experience and training pertaining to the skills of the trade. It will be the apprentices' duty to familiarize themselves generally in a manner that will lead to their advancement. As they

become familiar with the subjects and methods of work, they will be expected to perform any duties considered to be those of an apprentice.

Apprentices shall be taught the use, care, and effective handling of all tools and equipment commonly used in the trade to assure them of the skill and proficiency which characterize a journeyworker of the craft, as herein defined. Such on-the-job training shall be carried on under the control of the coordinator, under the direction and guidance of a journeyworker in their respective crafts.

25. Examinations

Apprentices shall be examined prior to advancement to each phase of their apprenticeship and whenever the coordinator considers it necessary to determine their progess. Consideration shall be given to related instruction and on-the-job work records and such other factors as are indicative of an apprentice's development in the skills of the trade. It is required that appropriate records of progress and evaluation be maintained.

APPENDIX A Work Processes

Work processes will be added as new job titles are included under these standards. Competence tests in any area described in these work processes may be developed. Any such test must be approved by the National Advisory Committee. The successful passing of a competence test will normally permit the granting of credit to the apprentice as described in Section 8 of these National Standards.

Approximate hours

Protective Signal Installer/Maintainer (3 Years)
(Protective Signal Installer)

DOT 822.361.018

Communications Technician I
Installs Protective Signaling Systems 2000
1. Pulls Wire and Cable
2. Lays out installation plans
3. Hooks up control equipment
4. Tests and checks out circuits
5. Tests and checks out components
6. Hooks up system to central office
7. Installs conduit and raceways
8. Care and use of tools and material
9. Care and use of test equipment
10. Safety throughout tasks

Communications Technician II
Installs Special Systems..... 2000
1. Installs gas suppression system
2. Installs water suppression system
3. Installs U.L. protective system

4. Installs visual system
5. Installs explosive system
6. Assembles control panels
7. Safety throughout tasks

Approximate hours

Communications Technician III
Maintains/Repairs Systems 2000

1. Fire systems
2. Intrusion alarm systems
3. Audio/visual systems
4. Central control systems
5. Perform shop work, bench repair etc.
6. Electrical & fire codes
7. Safety throughout tasks

Station/PBX/PABX/Installer/Maintainer (3 years)
(Private-Branch Exchange Repairer)

DOT 822.281.022

Communications Technician I
Installs Basic Telephone Systems 2000

1. Building code requirements and floor plans
2. Cable & wire installation using floor duct, conduit, stud drilling and associated tools & equipment
3. Cable & wire termination using industry standards, material, equipment and color code
4. Print reading and key sheets
5. Backboards layouts
6. Power supplies
7. Buzzer circuits
8. Installing 1A2 and similar systems
9. Test equipment = tone – test set, bug lamp
10. Ringer matrix
11. Safety throughout tasks

Approximate hours

Communications Technician II

Installs/Maintains PBX/PABX-Systems 2000

1. Electrical and telephone theory
2. Installation of specialized key systems PBX—PABX
3. System cable requirements for PBX and PABX
4. Electrical and environmental applications i.e. power, grounding, air conditioning & humidity control
5. Complete testing and troubleshooting
6. Test equipment i.e. scope and special test gear
7. Safety throughout tasks

Communications Technician III

Complete Telephone Systems Maintainer..... 2000

1. Advanced electronics
2. Specialized equipment
3. Telephone transmission
4. Safety throughout tasks

C.A.T.V. Installer/Maintainer (3 years)
(Television-Cable Installer)

DOT 821.281.010

Communications Technician I

General Overview of CATV Systems and Basic Installation 2000

1. Antenna Site (Headend towers)
2. Microwave fundamentals
3. Processors
4. Interconnects
5. Use of tools, equipment
6. Pole climbing
7. Reading Systems Analysis reports and following maps
8. Clearance, building and safety codes
9. General splicing
10. Drop distributors
11. Safety throughout tasks

Approximate hours

Communications Technician II

Cable Installation/Maintenance 2000

1. Using knowledge of interior/exterior construction
2. Using knowledge of pre-wiring
3. Following field diagramming
4. Solve television interference problems
5. Testing procedure using dipole test and convertors
6. Utilize basic electronic test equipment
7. T.V. set trouble shooting
8. Points of direct pick-up within C.A.T.V. System/T.V. set
9. Safety throughout tasks

Communications Technician III

C.A.T.V. Maintainer 2000

1. System noise
2. Trunk line layout
3. Methods of servicing
4. Calculating losses
5. Utilize electronic test equipment—Scope, Sweep Generator
6. Modulation/modulaters
7. Electronic circuits

Communications Technician III

C.A.T.V. Maintainer

8. Amplifier controls
9. Automatic C.A.T.V. systems
10. Transmitters and receivers
11. Super trunk-operation
12. Safety throughout tasks

Approximate hours

Splicer: Cable/fiber optics
(Cable Splicer)

DOT 829.361.010

Communications Technician I (3 Year) 2000

General Overview of Splicing

1. Rodding conduit and pulling cable.
2. Taking care of tools and equipment on cable trucks—such as gas tanks, gas pumps—etc.
3. Weatherproofing and fireproofing cables.
4. Testing and tracing circuits.
5. Safety throughout tasks.

Communications Technician II 2000

Complete Splicing Techniques Maintenance/Repair

1. Signal Cable installation: Splicing cables and connecting cables to connecting or junction blocks.
2. Making electrical connections between conductors and various types of equipment.
3. Signal and communication cable maintenance and repair.
4. Safety throughout tasks.

Communications Technician III 2000

Introduction and familiarization with Fiber Optics and associated equipment

1. Detectors—photo, silicone
2. Couplers—star and tee, star and loop
3. Repeaters
4. Digital Multiplexer—Digital networks
5. Nanometers
6. Megabit systems
7. Mixers
8. Rayleigh scattering
9. E.S.R. Cable

10. Plastic subducts
11. Electro optical/Acousto optical/Magneto optical
12. L.E.D.—(light emitting diodes—SIAPD—Pin diodes
13. Fusion splicing-aerial-buried-splice closures
14. O.T.D.R.—(optical time domain reflectometry)
15. Semi conductors Lasers transmitters
16. Array fabrication
17. Tools: (ie) Vacuum pump
    Vacuum fixture
    Vacuum dish
    Eye loop
    Heating strip
    Digital thermometer
18. Safety throughout tasks

APPENDIX B

Related instruction curriculum to be adjusted as job titles are included under these standards. Competency tests may be developed which will serve as proof that the apprentice has successfully accomplished the objectives associated with the related instruction. In those cases where competency is demonstrated in this way, the apprentice will be given credit for completing the appropriate related instruction. Any such competency test must be approved by the National Advisory Committee.

The curriculum described in the following pages is designed to provide for an increasingly difficult progression of skills and knowledge in telecommunications related activities. A particular job title will not necessarily incorporate the full range of these activities, but may require beginning competencies further into the progression or ending competencies somewhere before the end of the progression. This will be identified for each individual job title.

Persons who demonstrate competency throughout the full range of the progression to the satisfaction of the National Advisory Committee will receive a certificate to that effect.

CWA has been contracted by interested employers to create another year of related training. The fourth year contained in these standards only describe what may be developed and should be treated as an example.

Related Education

First Year

Course Descriptions:

Introduction

In the introductory course, the apprentice takes a Perceiving and Processing Information Review, and is introduced to the CWA Apprenticeship Program through the Manual and Apprentice Guidelines.

Hand Tools

To instruct the apprentice in the use, selection, maintenance, repair and safety practices related to tools and equipment in the telecommunications industry.

Safety and Health On and Off the Job

To provide the apprentice with a general overview of the health and safety hazards that they are likely to encounter, and the necessary precautionary measures to control the hazards. This course also introduces the apprentice to OSHA, Workers' Compensation and safety measures to use off the job.

Survey on Electronics

To provide the apprentice with basic mathematics skills for use in understanding basic electronics, and to provide basic knowledge regarding electricity (including, for example, Ohm's Law).

Basic Circuit Reading and Theory I

The objectives of this course are:

1) to present information that will help the apprentice to develop a practical understanding of electrical vocabulary and terms, circuit diagrams, and schematic diagrams; and
2) to enable the apprentice to interpret circuitry diagrams and drawings such that he/she can analyze, locate and clear trouble in common relay equipment.

Color Code

To familiarize the apprentice with the cable color code, cable group layout, cable assembly and core-layup.

Test Equipment

To instruct the apprentice in the function and operation of a volt-ohm meter, oscilloscope, and audio-frequency generator, among other types of test equipment.

Protection and Grounding/Wiring

The purpose of this course is to present the apprentices with basic information regarding protection and grounding principles, and outside wiring and wire clearances, as follows:

1) to provide instruction regarding the basic principles of protection and grounding as applied to aerial and buried plant, station-PBX and cable TV systems;
2) to instruct the apprentice in the procedures for installation of drop wiring from cable to building termination, and the use of appropriate attachments and fasteners to perform this function safely; and
3) to provide technical information regarding clearances between communication facilities and ground or rails, between conductors of other systems and structures, and at crossings over navigable waterways and in the vicinity of airports. This course also deals with separations and climbing spaces involving poles, wires, cables and guys.

Inside Wires and Fasteners

To instruct the apprentice in the types, use and application of the fasteners used for inside wire and cable operations.

D.C. Fundamentals I

To provide the apprentice with an understanding of the basic principles of electricty which are characteristic of D.C. circuits.

A.C. Fundamentals I

To provide an introduction to alternating current principles and applications, for example, magnetism and magnetic units; alternating voltage and current; the 60-Hz AC power line; inductance, inductive reactance and circuits; capacitance, catacitive reactance and circuits; RC and L/R time constants; and AC circuits.

Systems and Equipment I

To provide an overview of the specific knowledge and equipment needed to the voice, alarm and cable TV industries, including:

1) general knowledge and equipment;
2) special test equipment; and
3) special protection and grounding.

This course will enable all apprentices to develop a basic set of knowledge with regard to the industry in which they are working, as well as to gain an understanding of the interrelationships among the various telecommunications industries, at least at the apprentice level.

Defensive Driving

This course is to be taken between October and December of the first year that the apprentice is in training. The purpose is to provide an understanding of the factors involved in driving company vehicles safely and an appreciation of the apprentice's professional responsibility to the public and the employer.

Related Education

Second Year

Course Descriptions:

Work-related Mathematics/Computer programming

To provide the apprentice with information in mathematic fundamentals for use as a problem-solving tool in the telecommunications trades. The apprentice will also learn the principles of computer programming, and the types and applications of computers in the telecommunications industries.

Solid state devices/Digital Electronics

To provide apprentices with an understanding of solid state devices such as semi-conductor diodes, transistors, integrated circuits, digital electronics and other devices used in communications.

Working in the Telecommunications Industries

The purpose of this course is to review with the apprentices principles of public and customer relations techniques, interpersonal relations with co-workers, management and others, and to consider the structure and role of the telecommunications industry, and likely future developments.

D.C. Fundamentals II

To provide the apprentice with an understanding of advanced principles of D.C. electronics.

A.C. Fundamentals II

To provide the apprentice with an understanding of advanced principles and applications of A.C. electronics.

Data Transmission I

To provide basic principles and applications of advanced types of data transmission, including use of fiber optics, microwaves, satellites, and packet-switching.

First Aid and CPR

This course is to be taken during the second year that the apprentice is in training. The purpose is to provide the apprentice with knowledge of first aid for injuries requiring immediate treatment and its application to situations that may be encountered on the job. The apprentice will also learn CPR skills. The course should be taken from the local Red Cross.

Related Education

Third Year

Course Descriptions:

Systems and Equipment II

To provide the apprentice with knowledge regarding advanced equipment and technology used in the voice, alarm and cable TV industries, including:

1) general knowledge and equipment; and
2) special equipment particular to the three industries.

Data Transmission II

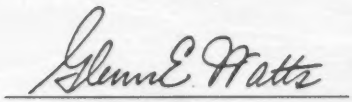
To provide the apprentice with advanced principles and applications of types of data transmission, with particular emphasis on general applications in the telecommunications industries, and particular applications in each of the three industries of concern.

Human Relations

To provide the apprentice with an understanding of human relations techniques necessary for successful work and personal relations, and to help the apprentice develop effective written and oral communications skills.

CWA
Communications Workers of America

The Undersigned hereby approve these National Apprenticeship and Training Standards for Training in the Telecommunications Industry:



Glenn E. Watts
President
Communications Workers of America

October 15, 1982
Date
As amended

Registered as part of the National Apprenticeship Program in accordance with the basic standards of apprenticeship established by the Secretary of Labor.

James P. Mitchell
Director
Bureau of Apprenticeship and Training

N-91078
Registation Number

October 26, 1982
Date
As amended